Center Innovation Fund: GSFC CIF

A Range Resolved CO2 Backscattering Profile Measurement Technique for Ground Calibration

Completed Technology Project (2011 - 2012)

Project Introduction

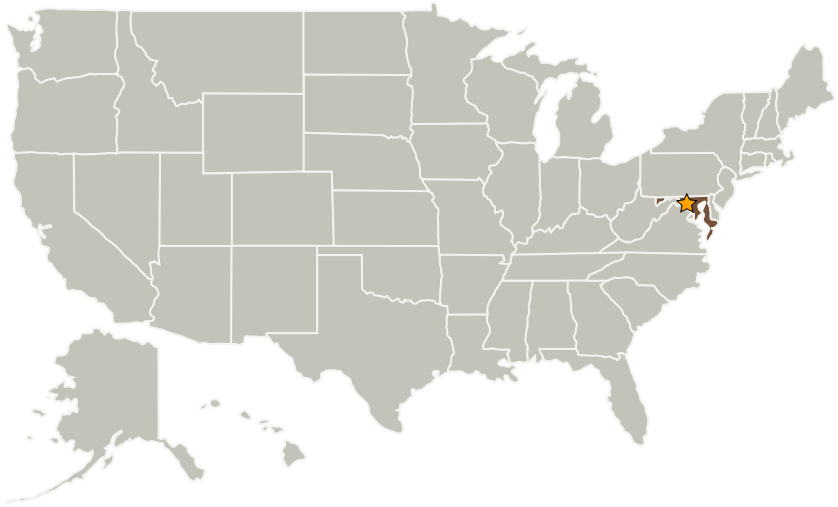
This innovative technique employs a 'return to zero pseudo noise' random modulation to extract several orders of magnitude more energy from a CW fiber laser than is possible via a conventional DIAL measurement thereby enabling commercial off-the-shelf technology to be used in place of expenses custom built laser systems. The challenge being investigated by this particular effort is to maximize how rapidly measurements can be made and thereby extract as many photons as possible from the laser..

This project involves modulating a commercial, distributed feedback, laser with a pseudo random code. It involves the optimization of laser pulse width versus the pumping of the fiber laser to extract the maximum amount of energy before encountering damaging nonlinear effects in the fiber amplifier. It also explores the impact of nonlinearities in the noise on measurement precision.

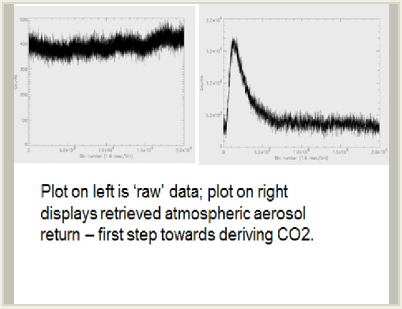
Anticipated Benefits

N/A

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland



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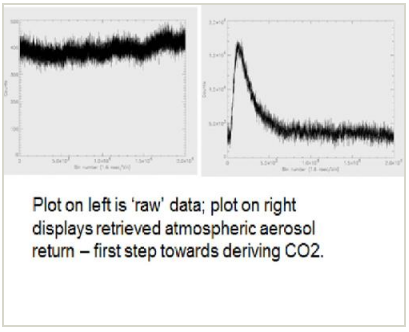
Primary U.S. Work Locations
Maryland

Images



52.jpg
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(https://techport.nasa.gov/image/1318)

Project Website:

http://sciences.gsfc.nasa.gov/sed/

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Center Innovation Fund: GSFC CIF

Project Management

Program Director:

Michael R Lapointe

Program Manager:

Peter M Hughes

Project Manager:

Michael J Amato

Principal Investigator:

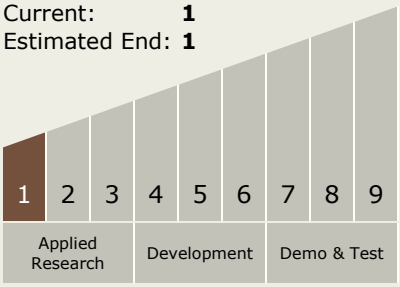
John F Burris

A Range Resolved CO2 Backscattering Profile Measurement Technique for Ground Calibration

Completed Technology Project (2011 - 2012)

Technology Maturity (TRL)

Start: **1**
Current: **1**
Estimated End: **1**



Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.5 Lasers